This Page Is Inserted by IFW Operations and is not a part of the Official Record

BEST AVAILABLE IMAGES

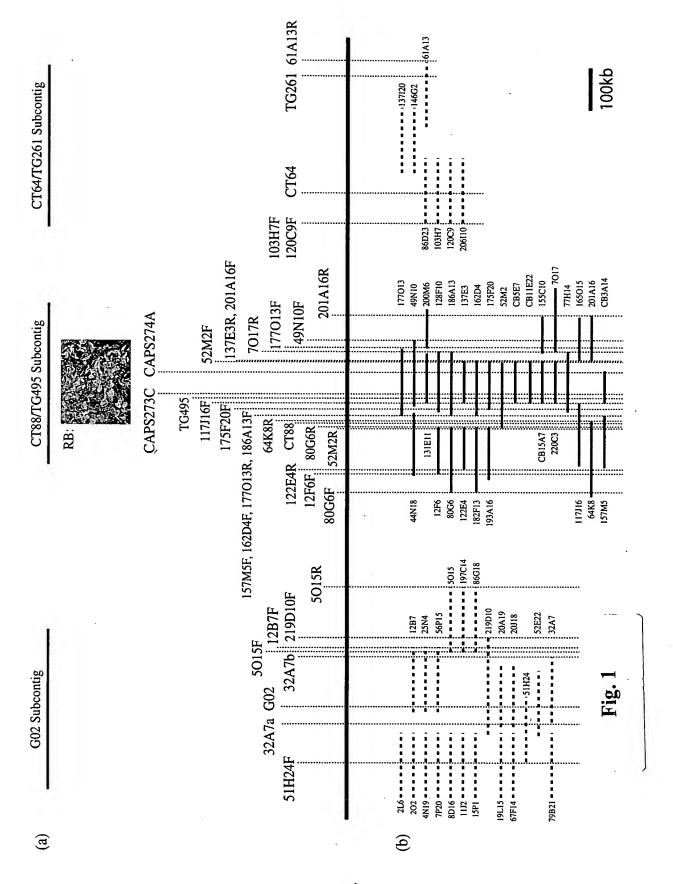
Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

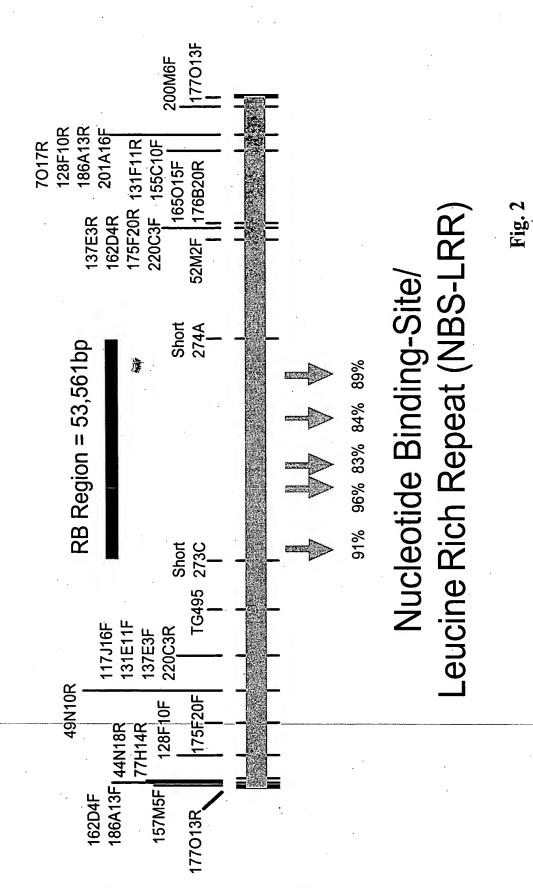
IMAGES ARE BEST AVAILABLE COPY.

As rescanning documents will not correct images, please do not report the images to the Image Problem Mailbox.

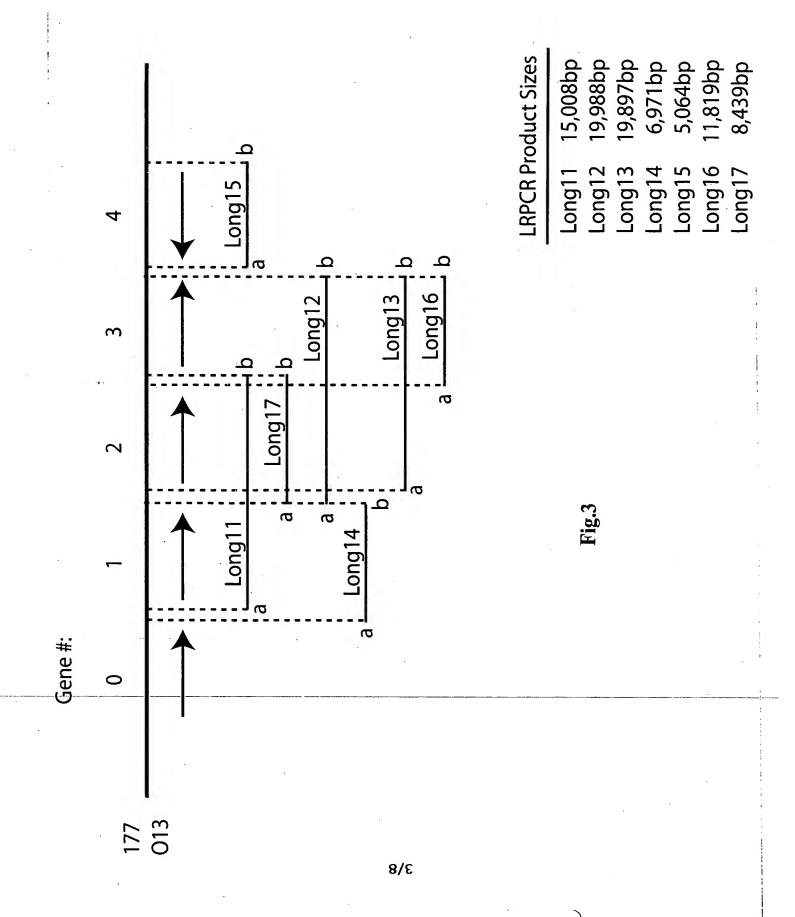


8/I

Docket No.: WARF-0235
App No.: Not Yet Assigned
Title: Potato Genes For Resistance to Late Blight
Inventors: John P. Helgeson, et al.
Attorney: Leslie E. Aberman
P Phone: (215) 568-3100 Filed: January 12, 2004

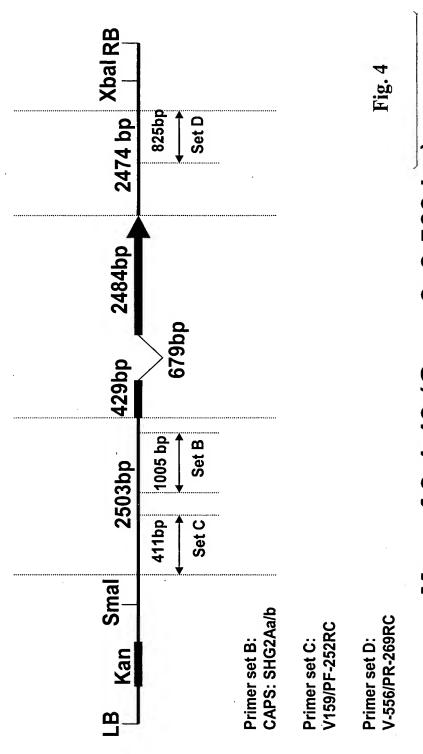


8/2



Броле: (215) 568-3100 Inventors: John P. Helgeson, et al. App No.: Not Yet Assigned
Title: Potato Genes For Resistance to Late Blight Filed: January 12, 2004

Docket No.: WARF-0235



Map of 2-4-48 (Gene 2, 8,569 bp)

8/7

Docket No.: WARE-0235

Docket No.: WARE-0235

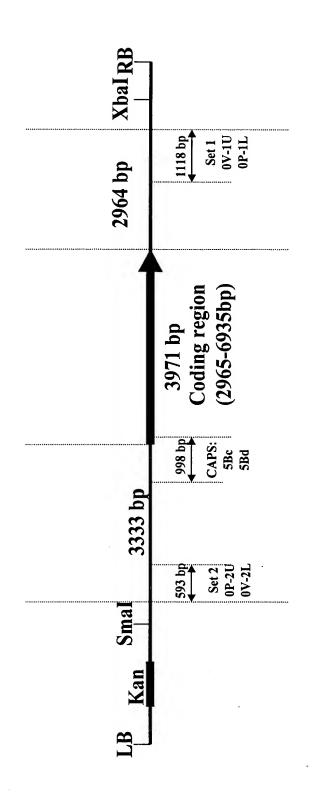
App No.: Mot Yet Assigned

Title: Potato Genes For Resistance to Late Blight

Inventors: John P. Helgeson, et al.

Attorney: Leslie E. Aberman

Sheet 4 of 8



Map of 4B6 (Gene 0, 10,268bp)

8/5

Docket No.: WARF-0235
App No.: Not Yet Assigned
Title: Potato Genes For Resistance to Late Blight
Inventors: John P. Helgeson, et al.
Attorney: Leslie E. Aberman
Sheet 5 of 8 Filed: January 12, 2004

Docket No.: WARF-0235
App No.: Not Yet Assigned Filed: January 12, 2004
Title: Potato Genes For Resistance to Late Blight
Inventors: John P. Helgeson, et al.
Attorney: Leslie E. Aberman Phone: (215) 568-3100
Sheet 6 of 8

	60
RB RGA1 RGA3 RGA4	MAEAFIQVLLDNLTSFLKGELVLLFGFQDEFQRLSSMFSTIQAVLEDAQEKQLNNKPLEN MAEAFIQVVLDNLTSFLKGELVLLFGFQDEFQRLSSMFSTIQAVLEDAQEKQLNDKPLEN MAEAFLQVLLDNLTFFIQGELGLVFGFEKEFKKLSSMFSMIQAVLEDAQEKQLKYKAIKN MAEAFLQVLLENLTSFIGDKLVLIFGFEKECEKLSSVFSTIQAVLQDAQEKQLKDKAIEN ****:**:*:**:**:**:**:**:**:**:**:**:**
RB RGA1 RGA3 RGA4	WLQKLNAATYEVDDILDEYKTKATRFSQSEYGRYHPKVIPFRHKVGKRMDQVMKKLKAIA WLQKLNAATYEVDDILDEYKTKATRFLQSEYGRYHPKVIPFRHKVGKRMDQVMKKLNAIA WLQKLNVAAYEVDDILDDCKTEAARFKQAVLGRYHPRTITFCYKVGKRMKEMMEKLDAIA WLQKLNSAAYEVDDILGECKNEAIRFEQSRLGFYHPGIINFRHKIGRRMKEIMEKLDAIS ***** *: *: *: *: *: *: *: *: *: *: *: *
RB RGA1 RGA3 RGA4	EERKNFHLHEKIVERQAVRRETGSVLTEPQVYGRDKEKDEIVKILINNVSDAQHLSVL EERKKFHLQEKIIERQAATRETGSVLTEPQVYGRDKEKDEIVKILINTASDAQKLSVL EERRNFHLDERIIERQAARRQTGFVLTEPKVYGREKEEDEIVKILINNVSYSEEVPVL EERRKFHFLEKITERQAAAATRETGFVLTEPKVYGRDKEEDEIVKILINNVNVAEELPVF ***::**: *:* *:** *:** *:** *:** *:**
RB RGA1 RGA3 RGA4	PILGMGGLGKTTLAQMVFNDQRVTEHFHSKIWICVSEDFDEKRLIKAIVESIEGRPLLGE PILGMGGLGKTTLSQMVFNDQRVTERFYPKIWICISDDFNEKRLIKAIVESIEGKSLS-D PILGMGGLGKTTLAQMVFNDQRITEHFNLKIWVCVSDDFDEKRLIKAIVESIEGKSLG-D PIIGMGGLGKTTLAQMIFNDERVTKHFNPKIWVCVSDDFDEKRLIKTIIGNIE-RSSPHV **:*******:*:::::::::::::::::::::::::
RB RGA1 RGA3 RGA4	300 MDLAPLQKKLQELLNGKRYLLVLDDVWNEDQQKWANLRAVLKVGASGASVLTTTRLEKVG MDLAPLQKKLQELLNGKRYFLVLDDVWNEDQHKWANLRAVLKVGASGAFVLTTTRLEKVG MDLAPLQKKLQELLNGKRYFLVLDDVWNEDQEKWDNLRAVLKIGASGASILITTRLEKIG EDLASFQKKLQELLNGKRYLLVLDDVWNDDLEKWAKLRAVLTVGARGASILATTRLEKVG ***.:*********************************
RB RGA1 RGA3 RGA4	SIMGTLQPYELSNLSQEDCWLLFMQRAFGHQEEINPNLVAIGKEIVKKSGGVPLAAKTLG SIMGTLQPYELSNLSPEDCWFLFMQRAFGHQEEINPNLMAIGKEIVKKCGGVPLAAKTLG SIMGTLQLYQLSNLSQEDCWLLFKQRAFCHQTETSPKLMEIGKEIVKKCGGVPLAAKTLG SIMGTLQPYHLSNLSPHDSLLLFMQRAFGQQKEANPNLVAIGKEIVKKCGGVPLAAKTLG ****** * .**** .*
RB RGA1 RGA3 RGA4	GILCFKREERAWEHVRDSPIWNLPQDESSILPALRLSYHQLPLDLKQCFAYCAVFPKDAK GILRFKREEREWEHVRDSPIWNLPQDESSILPALRLSYHHLPLDLRQCFVYCAVFPKDTK GLLRFKREESEWEHVRDSEIWNLPQDENSVLPALRLSYHHLPLDLRQCFAYCAVFPKDTK GLLRFKREESEWEHVRDNEIWSLPQDESSILPALRLSYHHLPLDLRQCFAYCAVFPKDTK *:* **** ***** ***********************
RB RGA1 RGA3 RGA4	MEKEKLISLWMAHGFLLSKGNMELEDVGDEVWKELYLRSFFQEIEVKDGKTYFKMHDLIH MAKENLIAFWMAHGFLLSKGNLELEDVGNEVWNELYLRSFFQEIEVESGKTYFKMHDLIH IEKEYLIALWMAHSFLLSKGNMELEDVGNEVWNELYLRSFFQEIEVKSGKTYFKMHDLIH MIKENLITLWMAHGFLLSKGNLELEDVGNEVWNELYLRSFFQEIEAKSGNTYFKIHDLIH

Docket No.: WARF-0235
App No.: Not Yet Assigned Fi
Title: Potato Genes For Resistance to Late Blight
Inventors: John P. Helgeson, et al.
Attorney: Leslie E. Aberman Pl
Sheet 7 of 8 Filed: January 12, 2004

Phone: (215) 568-3100

7/8

	.,,
RB RGA1 RGA3 RGA4	DLATSLFSANTSSSNIREINKHSYTHMMSIGFAEVVFFYTLPPLEKFISL DLATSLFSANTSSSNIREINANYDGYMMSIGFAEVVSSYSPSLLQKFVSL DLATSMFSASASSRSIRQINVKDDEDMMFIVTNYKDMMSIGFSEVVSSYSPSLFKRFVSL DLATSLFSASASCGNIREINVKDYKHTVSIGFAAVVSSYSPSLLKKFVSL ****: **
RB RGA1 RGA3 RGA4	RVLNLGDSTFNKLPSSIGDLVHLRYLNLYG-SGMRSLPKQLCKLQNLQTLDLQYCTKLCC RVLNLRNSNLNQLPSSIGDLVHLRYLDLSGNFRIRNLPKRLCKLQNLQTLDLHYCDSLSC RVLNLSNSEFEQLPSSVGDLVHLRYLDLSG-NKICSLPKRLCKLQNLQTLDLYNCQSLSC RVLNLSYSKLEQLPSSIGDLLHLRYLDLSC-NNFRSLPERLCKLQNLQTLDVHNCYSLNC **** * :::***:****: * . * . * . * . * .
RB RGA1 RGA3 RGA4	LPKETSKLGSLRNLLLDGSQSLTCMPPRIGSLTCLKTLGQFVVGRKKGYQLGELGNLNLY LPKQTSKLGSLRNLLLDG-CSLTSTPPRIGLLTCLKSLSCFVIGKRKGHQLGELKNLNLY LPKQTSKLCSLRNLVLDH-CPLTSMPPRIGLLTCLKTLGYFVVGERKGYQLGELRNLNLR LPKQTSKLSSLRHLVVDG-CPLTSTPPRIGLLTCLKTLGFFIVGSKKGYQLGELKNLNLC ***:*** ***:*:*
RB RGA1 RGA3 RGA4	GSIKISHLERVKNDKDAKEANLSAKGNLHSLSMSWNNFGPHIYESEEVKVLEALKPHSNL GSISITKLDRVKKDTDAKEANLSAKANLHSLCLSWDLDGKHRYDSEVLEALKPHSNL GAISITHLERVKNDMEAKEANLSAKANLHSLSMSWDRPNRYESEEVKVLEALKPHPNL GSISITHLERVKNDTDA-EANLSAKANLQSLSMSWDNDGPNRYESKEVKVLEALKPHPNL *:*.*::*:*:*:*:*:*:*:*:*:*:*:*:*:*:*:*:
RB RGA1 RGA3 RGA4	TSLKIYGFRGIHLPEWMNHSVLKNIVSILISNFRNCSCLPPFGDLPCLESLELHWGSADV KYLEINGFGGIRLPDWMNQSVLKNVVSIRIRGCENCSCLPPFGELPCLESLELHTGSADV KYLEIIDFCGFCLPDWMNHSVLKNVVSILISGCENCSCLPPFGELPCLESLELQDGSVEV KYLEIIAFGGFRFPSWINHSVLEKVISVRIKSCKNCLCLPPFGELPCLENLELQNGSAEV . *: * *::*:*::*:::::::::::::::::::::::
RB RGA1 RGA3 RGA4	EYVEEVDIDVHSGFPTRIRFPSLRKLDIWDFGSLKGLLKKEGEEQFPVLEEMIIHECPFL EYVEDNVHPGRFPSLRKLVIWDFSNLKGLLKMEGEKQFPVLEEMTFYWCPMF EYVEDSGFLTRRFPSLRKLHIGGFCNLKGLQRMKGAEQFPVLEEMKISDCPMF EYVEEDDVHSRFSTRRSFPSLKKLRIWFFRSLKGLMKEEGEEKFPMLEEMAILYCPLF ***: ***: ***: ***: ***: ***: ***:
RB RGA1 RGA3 RGA4	TLSSNLRALTSLRICYNKVATSFPEEMFKNLANLKYLT VIPTLSSVKTLKVI-VTDATVLRSISNLRALTSLDISDNVEATSLPEEMFKSLANLKYLK VFPTLSSVKKLEIWGEADAGGLSSISNLSTLTSLKIFSNHTVTSLLEEMFKNLENLIYLS VFPTLSSVKKLEVHGNTNTRGLSSISNLSTLTSLRIGANYRATSLPEEMFTSLTNLEFLS .:
RB RGA1 RGA3 RGA4	ISRCNNLKELPTSLASLNALKSLKIQLCCALESLPEEGLEGLSSLTELFVEHCNMLKCLP ISFFRNLKELPTSLASLNALKSLKFEFCDALESLPEEGVKGLTSLTELSVSNCMMLKCLP VSFLENLKELPTSLASLNNLKCLDIRYCYALESLPEEGLEGLSSLTELFVEHCNMLKCLP FFDFKNLKDLPTSLTSLNALKRLQIESCDSLESFPEQGLEGLTSLTQLFVKYCKMLKCLP***:**** ** * * .:. * :***:**:**:** * . * * ******* 1005
RB RGA1 RGA3 RGA4	EGLQHLTTLTSLKIRGCPQLIKRCEKGIGEDWHKISHIPNVNIYI EGLQHLTALTTLTITQCPIVFKRCERGIGEDWHKIAHIPYLTLYE EGLQHLTTLTSLKIRGCPQLIKRCEKGIGEDWHKISHIPNVNIYI EGLQHLTALTNLGVSGCPEVEKRCDKEIGEDWHKIAHIPNLDIH- *******: ** : ** : ****:: ****** : ::

Docket No.: WARF-0235
App No.: Not Yet Assigned Filed: January 12, 2004
Title: Potato Genes For Resistance to Late Blight
Inventors: John P. Helgeson, et al.
Attorney: Leslie E. Aberman Phone: (215) 568-3100
Sheet 8 of 8

8/8

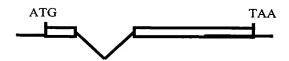


Fig. 7a

MAEAFIQVLLDNLTSFLKGELVLLFGFQDEFQRL SSMFSTIQAVLEDAQEKQLNNKPLENWLQKLNAA TYEVDDILDEYKTKATRFSQSEYGRYHPKVIPFR **HKVGKRMDQVMKKLKAIAEERKNFHLHEKIVERQ** AVRRETGSVLTEPQVYGRDKEKDEIVKILINNVS DAQHLSVLPILGMGGLGKTTLAQMVFNDQRVTEH FHSKIWICVSEDFDEKRLIKAIVESIEGRPLLGE MDLAPLQKKLQELLNGKRYLLVLDDVWNEDQQKW ANLRAVLKVGASGASVLTTTRLEKVGSIMGTLQP YELSNLSQEDCWLLFMQRAFGHQEEINPNLVAIG KEIVKKSGGVPLAAKTLGGILCFKREERAWEHVR $ext{DSPIWNLPQDESSILPAL}$ RLSYH $ext{QLPL}$ DLKQ $ext{CFA}$ YCAVFPKDAKMEKEKLISLWMAHGFLLSKGNMEL EDVGDEVWKELYLRSFFQEIEVKDGKTYFKMHDL IHDLATSLFSANTSSSNIREINKHSYTHMMSIGF AEVVFFYTLPP

LEKFISLRVLNLGDSTFNKLPSS IGDLVHLRYLNLYGSGMRSLPKO LCKLQNLQTLDLQYCTKLCCLPKE TSKLGSLRNLLLDGSQSLTCMPPRIGS **L**TCLKTLGQFVVGRKK GYQLGELGNLNLYG SIKISHLERVKNDKDAKEAN LSAKGNLHSLSMSWNNFGPHIYE SEEVKVLEALKPHSNLT SLKIYGFRGIHLPEWMN HSVLKNIVSILISNFRNCSCLPP FGDLPCLESLELHWG SADVEYVEEVDIDVHSGFPT RIRFPSLRKLDIWDFGSLKGLLKKEG EEQFPVLEEM_IHECPFLTL SSNLRALTSLRICYNKVATSFPEEM FKNLANLKYLTISRCNNLKELPTS LASLNALKSLKIQLCCALESLPEEG LEGLSSLTELFVEHCNMLKCLPEG LQHLTTLTSLKIRGCPQLIKRCEKGIGED WHKISHIPNVNIYI

Fig. 7b